

In re PANIGRAHY ET AL., Application No. 10/801,907
Amendment A

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Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An apparatus for determining a longest matching prefix, the apparatus comprising:

- an external memory for storing one or more non-first-level tiny trees; and
- an applications specific integrated circuit (ASIC) including a lookup engine and internal memory for storing a set of first-level tiny trees, the ASIC configured to perform operations, said operations including:

- determining which particular first-level tiny tree of a plurality of first-level tiny trees to search based on a lookup value;

- retrieving a ~~first-level~~ first-level root node of said particular first-level tiny tree from said internal memory, the first-level root node including a first-level plurality of keys;

- traversing said particular first-level tiny tree stored in said internal memory to identify a next-level tiny tree, said traversing said particular first-level tiny tree including comparing the lookup value with one or more of the first-level plurality of keys, wherein the first-level tiny tree and the next-level tiny tree ~~trees~~ are independent trees;

- retrieving a root node of the next-level tiny tree stored in the external memory, the root node including a plurality of keys to compare with the lookup value and a back value to identify a matching prefix should no matching prefix be identified within said particular tree;

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traversing said particular next-level tiny tree stored in the external memory to either identify a matching prefix or a no match condition, said traversing said particular next-level tiny tree including comparing the lookup value with one or more of the plurality of keys; and

identifying as the longest matching prefix a prefix identified based on the back value if said traversing resulted in said no match condition else the matching prefix.

Claim 2 (original): The apparatus of claim 1, comprising an associative memory, wherein said determining which particular first-level tiny tree of a plurality of first-level tiny trees to search based on a lookup value includes performing a lookup operation on the associative memory based on the lookup value.

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Claim 3 (currently amended): A method for identifying a longest matching prefix, the method comprising:

determining which particular first-level tiny tree of a plurality of first-level tiny trees to search based on a lookup value;

retrieving a first-level root node of said particular first-level tiny tree, the first-level root node including a first-level plurality of keys;

traversing said particular first-level tiny tree to identify a next-level tiny tree, said traversing said particular first-level tiny tree including comparing the lookup value with one or more of the first-level plurality of keys, wherein the first-level tiny tree and the next-level tiny tree trees are independent trees;

retrieving a root node of the next-level tiny tree, the root node including a plurality of keys to compare with the lookup value and a back value to identify a matching prefix should no matching prefix be identified within said particular tree;

traversing said particular next-level tiny tree to either identify a matching prefix or a no match condition, said traversing said particular next-level tiny tree including comparing the lookup value with one or more of the plurality of keys; and

identifying as the longest matching prefix a prefix identified based on the back value if said traversing resulted in said no match condition else the matching prefix.

Claim 4 (currently amended): The method of claim 3, wherein the first-level tiny tree is associated with no back values.

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Claim 5 (currently amended): A tangible computer-readable medium ~~containing~~
storing therein computer-executable instructions for performing steps for identifying a longest
matching prefix, said steps comprising:

determining which particular first-level tiny tree of a plurality of first-level tiny trees to
search based on a lookup value;

retrieving a first-level root node of said particular first-level tiny tree, the first-level
root node including a first-level plurality of keys;

traversing said particular first-level tiny tree to identify a next-level tiny tree, said
traversing said particular first-level tiny tree including comparing the lookup value with one or
more of the first-level plurality of keys, wherein the first-level tiny tree and the next-level tiny
tree ~~trees~~ are independent trees;

retrieving a root node of the next-level tiny tree, the root node including a plurality of
keys to compare with the lookup value and a back value to identify a matching prefix should
no matching prefix be identified within said particular tree;

traversing said particular next-level tiny tree to either identify a matching prefix or a
no match condition, said traversing said particular next-level tiny tree including comparing the
lookup value with one or more of the plurality of keys; and

identifying as the longest matching prefix a prefix identified based on the back value if
said traversing resulted in said no match condition else the matching prefix.

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Claim 6 (currently amended): An apparatus for identifying a longest matching prefix,
the method comprising:

means for determining which particular first-level tiny tree of a plurality of first-level
tiny trees to search based on a lookup value;

means for retrieving a first-level root node of said particular first-level tiny tree, the
first-level root node including a first-level plurality of keys;

means for traversing said particular first-level tiny tree to identify a next-level tiny
tree, said traversing said particular first-level tiny tree including comparing the lookup value
with one or more of the first-level plurality of keys, wherein the first-level tiny tree and the
next-level tiny ~~tree~~ trees are independent trees;

means for retrieving a root node of the next-level tiny tree, the root node including a
plurality of keys to compare with the lookup value and a back value to identify a matching
prefix should no matching prefix be identified within said particular tree;

means for traversing said particular next-level tiny tree to either identify a matching
prefix or a no match condition, said traversing said particular next-level tiny tree including
comparing the lookup value with one or more of the plurality of keys; and

means for identifying as the longest matching prefix a prefix identified based on the
back value if said traversing resulted in said no match condition else the matching prefix.

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Claim 7-23 (cancelled)

Claim 24 (new): An apparatus comprising one or more processors and a memory, wherein the memory stores one or more instructions that, when executed by the one or more processors, perform the operations of:

determining which particular first-level tiny tree of a plurality of first-level tiny trees to search based on a lookup value;

retrieving a first-level root node of said particular first-level tiny tree, the first-level root node including a first-level plurality of keys;

traversing said particular first-level tiny tree to identify a next-level tiny tree, said traversing said particular first-level tiny tree including comparing the lookup value with one or more of the first-level plurality of keys, wherein the first-level tiny tree and the next-level tiny tree are independent trees;

retrieving a root node of the next-level tiny tree, the root node including a plurality of keys to compare with the lookup value and a back value to identify a matching prefix should no matching prefix be identified within said particular tree;

traversing said particular next-level tiny tree to either identify a matching prefix or a no match condition, said traversing said particular next-level tiny tree including comparing the lookup value with one or more of the plurality of keys; and

identifying as the longest matching prefix a prefix identified based on the back value if said traversing resulted in said no match condition else the matching prefix.

Claim 25 (new): The apparatus of claim 24, wherein the first-level tiny tree is associated with no back values.